

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

## PCT

To:

see form PCT/ISA/220

### WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/JP2004/004710

International filing date (day/month/year)  
31.03.2004

Priority date (day/month/year)  
01.04.2003

International Patent Classification (IPC) or both national classification and IPC  
H01L51/20, H01L51/50

Applicant  
CANON KABUSHIKI KAISHA

**1. This opinion contains indications relating to the following items:**

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

**2. FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

**3. For further details, see notes to Form PCT/ISA/220.**

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WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

JC20 Rec'd PCT/PTO

07

JUL 2005

International Application No.  
PCT/JP2004/004710

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**Box No. I Basis of the opinion**

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1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ in written format
    - ☐ in computer readable form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in computer readable form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/JP2004/004710

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**Box No. II Priority**

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1. ☒ The following document has not been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

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**Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	3,5,7,9,11-14
	No: Claims	1,2,4,6,8,10
Inventive step (IS)	Yes: Claims	
	No: Claims	1-14
Industrial applicability (IA)	Yes: Claims	1-14
	No: Claims	

2. Citations and explanations

**see separate sheet**

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**Box No. VII Certain defects in the international application**

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The following defects in the form or contents of the international application have been noted:

**see separate sheet**

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**Box No. VIII Certain observations on the international application**

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The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

**Re Item V.**

- 1 The following documents are referred to in this communication:

D1 : PATENT ABSTRACTS OF JAPAN vol. 2002, no. 08, 5 August  
2002 (2002-08-05) & JP 2002 110999 A (TOSHIBA CORP), 12 April 2002  
(2002-04-12)

- 2 INDEPENDENT CLAIMS 1, 4, 10 AND DEPENDENT CLAIMS 2, 6 AND 8

- 2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1, 2, 4, 6, 8, and 10 is not new in the sense of Article 33(2) PCT.

- 2.2 Document D1, which is considered to represent the most relevant state of the art, discloses an organic semiconductor device and in particular a thin film transistor comprising a gate electrode (2), a gate insulating layer (3), a source electrode (4) a drain electrode (5) and a channel generating semiconductor layer (6) formed on a substrate (1). As gate insulating layer (3) inorganic particles (3-1) diffused in an amorphous insulator (3-2) are used. D1 teaches to use for instance fullerene C60, thiophene oligomers, poly-(3-alkyl)thiophenes or metal phthalocyanine as organic semiconductor layer (6) (cf. par. 14) and the application of various metal oxide particles (cf. par. 42) in combination with amorphous organic macromolecular layer of e.g. cyanoethyl cellulose and others (cf. par. 44-46) or poly-(2-chloro-ethyl)silsesquioxane (cf. par. 58).

In an example, an organic semiconductor device with poly ( $\beta$ -chloro-ethyl)silsesquioxane in the gate insulating layer is disclosed, wherein a substrate was coated (spin coating) with a solution of a polyorganosilsesquioxane according to formula 2 of the present application and dried at a temperature of 200 °C; Barium titanate particles were used as inorganic particles in the insulator layer (cf. par. 102-104).

Consequently, the subject-matter of the aforementioned claims of the present application lacks novelty and inventive step in the sense of Articles 33(2) and (3) PCT.

**3 INDEPENDENT CLAIMS 12, 13, DEPENDENT CLAIMS 3, 5, 7, 9, 11 AND 14**

3.1 Although neither a thickness of the gate insulating layer being between 50 nm and 250 nm, nor the addition of formic acid to the solution of polyorganosilsesquioxane compound, nor the reduction of the refractive index of the gate insulator after drying by 0.015 or more at 632 nm is disclosed in the available prior art documents, these technical modifications are obvious for a person skilled in the art faced with the technical problem to be solved by the subject-matter of the novel claims 3,5,7,9 and 11-14 of the present application.

3.3 This technical problem to be solved underlying the subject-matter of these claims meeting the requirement of novelty (Article 33(2) PCT) can be seen in the provision of a further organic semiconductor device. The comparative examples given in the description of the present application cannot be regarded as a suitable basis for the demonstration of an unexpected property and/or effect, because no comparison with the closest state of the art as shown in the device of D1 having an gate insulating layer wherein the insulator has a silsesquioxane skeleton is disclosed was made (cf. section 2 above)

3.4 Hence the independent claims 12, 13 and the dependent claims 3, 5, 7, 9, 11 and 14 apparently do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step (Article 33 (3) PCT).

**Re Item VII.**

A document reflecting the prior art described on pages 36-51 (comparative examples), is not identified in the description (Rule 5.1(a)(ii) PCT).

**Re Item VIII.**

1. The application does not meet the requirements of Article 6 PCT, because claims 7 and 13 are not clear.

2. Claims 7 and 13 do not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The claims attempts to define the subject-matter in terms of the result to be achieved, which merely amounts to a statement of the underlying problem, without providing the technical features necessary for achieving this result. This effect to be achieved is seen in the reduction of the refractive index at a wavelength of 632 nm by 0.015 or more after the drying step.
- 2.1 Moreover, as far as the product claim 13 is concerned, this statement of the "result to be achieved" is a feature in the apparatus claim relating to a method of making the device rather than clearly defining the device in terms of its technical features. The intended limitations are therefore not clear from this claim, contrary to the requirements of Article 6 PCT.
3. The vague and imprecise statement in the description on page 54, lines 20-22 ("*...the scope of the present invention...*") implies that the subject-matter for which protection is sought may be different to that defined by the claims, thereby resulting in lack of clarity (Article 6 PCT) when used to interpret them.